The eggs and nesting habits of the St. Helena Sand-Plover or Wirebird, *Charadrius pecuarius sanctae-helenae* (Harting)

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Received 1st May, 1965

Taxonomy: Peters (1934) recognises *Charadrius pecuarius allenbyi* Nicoll as a race of *C. pecuarius*, as also do Meinertzhagen (1930), and Etchécopar and Hüe (1964), but Peters accords specific status to *sanctae-helenae* with which Bock (1958) and others, rightly I consider, disagree. Perhaps *C. p. allenbyi*, which averages smaller and with a tendency to be more brightly coloured below—*vide* Meinertzhagen (1930) "The rusty coloured breast and small size are characteristic"—should be regarded as the end of a cline?

General: Apart from seafowl, the St. Helena race, *sanctae-helenae* of *Charadrius pecuarius* Temminck, locally known as 'Wirebird', is regarded as the only indigenous bird species on this island, though there is reason to believe that also the Moorhen, *Gallinula chloropus* (Linn.), not introduced by man, has long been resident, Benson (1950), having been first recorded in 1718, though it is possible that for a while it disappeared and then later re-established itself. There are no indigenous passerines and those—in considerable variety—and others that are present have been introduced within the past 250 years.

Fossil remains of no great antiquity indicate the existence formerly of a rail which is described by Wetmore (1963) *Aphanocrex* gen. nov. and he records "become specialized for an active life in walking and running on land", which suggests that like *C. pecuarius* it had established itself and become adapted to an unfavourable environment.

Ashmole (1963), too, refers to fossil columbid remains and also records "Forster who visited St. Helena in May 1775" mentioned seeing on Diana's Peak (or on the way there) a "small kind of blue dove, which is said to have been originally found in the country." The widespread deforestation which occurred after the introduction of goats, would have accounted for this bird's disappearance, probably assisted by its value as food. There might also have been an endemic hoopoe. But so far no fossil *C. pecuarius* material has been found. The Wirebird presumably originated, when one does not know, from a chance incursion from the African mainland, some 1,300 miles distant, and despite somewhat unfamiliar conditions of terrain established itself as a breeding species.

With reference to the origin of *C.p. sanctae-helenae*, Bock (1958) offers the theory "The Madagascar *thoracicus* is also very close to *pecuarius* and may represent an earlier invasion of Madagascar by a pre-*pecuarius* stock. Later, *pecuarius* invaded Madagascar for the second time so that today the two species are sympatric." Bock states categorically that a breast band—which *thoracicus* has, but not *pecuarius*—is a "primitive" trait in the genus *Charadrius* and suggests that "If Africa is the original home of the species (*pecuarius*), then this is a case of a peripheral population (*thoracicus*) of a species retaining a primitive characteristic." But he then proceeds to demolish this theory with the alternative hypothesis "that Madagascar is the ancestral home of the species which invaded Africa and gave rise to *pecuarius*, which in turn re-invaded Madagascar."

Therefore, according to Bock, *sanctae-helenae* is not of primitive stock and has presumably developed from an incursion of the island from the African mainland, a claim which perhaps can be supported by the absence of fossil remains.

Arthur Loveridge (*in litt.*) the authority on African herpetology, who now resides on St. Helena, concurs with what another resident informed me when I visited the island in October 1950 and saw a pair of Wirebirds busily feeding in his garden, that the name 'Wirebird' refers to this little plover's rather long, wiry legs. In past literature several authorities are not agreed about the derivation, either claiming its origin to be the wiry legs or the wiry grass (*Cynodon dactylon*) of its habitat. But I am inclined to support the theory that it is the wiry legs to which the popular name refers for I feel the locals were more likely to be impressed by a conspicuous characteristic of the bird itself rather than an association with its habitat. The Wirebird is well depicted on the 3*d.* stamp of the island's 1953 issue of postage stamps. Benson (*in litt.*) "The longer tarsus is immediately apparent to anyone who is familiar with African *pecuarius*".

Habits: In its habits generally *sanctae-helenae* differs little from nominate *pecuarius*, but a character which it shares with *allenbyi*, though not noticeable elsewhere—except at breeding time—is that this island race is mostly found in pairs some of which regularly visit gardens and can be seen foraging unconcernedly close to a bungalow, as I was able to witness. They seem to feed wherever there are suitable conditions such as open grasslands, ploughed fields or large vegetable gardens. Except at breeding time when the majority of these little plovers congregate on the more remote open plains where there is little possibility of frequent disturbance, their distribution which is widespread, can scarcely be described as 'local'.

Population: Loveridge suggests "the total population as something just under a thousand", which is most encouraging as Haydock (1954) who spent three months on the island in 1952 investigating its bird life during the Wirebird's breeding season, estimated that there were some 30 pairs on the main breeding ground and that the total population was about 100 pairs. Haydock discovered eleven breeding grounds, three of which were extensive, another of fair size and the remaining seven, small.

Habitat: St. Helena, then uninhabited, was discovered in 1502 and the introduction of goats in 1513 heralded the speedy destruction of the forests, which were said to cover the island. The Wirebird seems to have been first recorded in 1656 (Benson, 1950) and examples collected in 1842 —now at the British Museum (Natural History)—are of the typical large island race. Could a large new race, with some distinctive markings and laying a large egg, have evolved in some 300 years only? But there is reason to believe that the early visitors (or some of them) erred in their claim that forest covered the island and it seems probable that long before its discovery there had been open spaces which provided *Charadrius pecuarius* with a suitable habitat. Benson (*in litt.*) rightly emphasises "that African *pecuarius* (as I know it, anyway) is never far from water."

Breeding season and nests: As in the case of *pecuarius* elsewhere, climatic conditions on the island evidently determine the breeding season of *sanctae-helenae*, which lies during the drier period of the year, though

damp mists, sometimes prevailing throughout the day, are common. The rainy season derived from the south-east trade winds may extend from March to the end of August (which is the wettest month of the year). The island rains, as compared with those on the mainland, lack the intensity which can at times make conditions so adverse for those species which make no nest and lay their eggs on the bare ground. It is possible that an inherent factor—the original mainland climatic influence—has been responsible for determining the breeding season of *sanctae-helenae*. The season during which the eggs are laid may last from October (perhaps even the latter part of September) till January (or even later), certainly four months and perhaps longer (Loveridge has egg records for April and late May); and the nesting habits are generally similar to those of the mainland races. But on St. Helena nests are evidently easier to locate than elsewhere, for Loveridge and his wife had little difficulty in finding nests whenever they went out to look for them. On the first occasion that they undertook a search, in a little over three hours they had located four nests each with one egg, and it may be that eggs—the full set being two—are not laid on consecutive, but on alternate days, for when the four nests were re-visited the following day each still contained only one egg, and one of them which was collected was fresh. During this second visit a further search revealed three more nests—one with one egg, the others with two eggs each; both these c/2 were collected (Loveridge having been asked to obtain a small series) and the eggs proved to be fresh.

The brooding birds were observed again and again, as they left the nest, to cover the eggs, which is customary for the species. The Wirebird's eggs are completely covered all but a circular section some 12 to 18 mm. in diameter, and what is fully exposed rarely exceeds 12 mm. across. The nature of the soil doubtless prevented the eggs from being completely hidden as occurs when this sand-plover nests in sandy or soft soil. Sometimes the ground was too hard for the departing parent to cover its eggs successfully as there was little soil to kick over them and the eggs were then left lying on their sides and very much exposed.

Loveridge observed courtship and mating, as well as the change-over of the brooding bird. On one occasion he watched a female being mated by the male while a nearly month-old chick stood quietly beside them. This seems to suggest that this plover is probably double-brooded.

On the sandy northern shore of Lake Victoria, at Entebbe in Uganda, I found it exceptionally difficult to locate eggs of the nominate race—although there were many nesting pairs—as they were so skilfully covered and as the brooding bird was adept at making an early and undetected get-away. But when I was accompanied by a dog which ranged around, the brooding bird sat tight long enough for her departure from the actual nest to be observed. Also, a rider on horse-back could locate nests with ease, as the parent left its nest at the last moment and only when it seemed the eggs might be endangered. I never tried to locate a hidden nest from a moving car lest one unwittingly damaged the eggs, but Loveridge knowing the location of a nest took a visiting photographer by car "to within 6 feet of the docile bird" sitting on its eggs. Later, after the bird had been induced to leave its nest and when the eggs were being photographed—covered and uncovered—she did everything an anxious parent should do

to distract the intruders' attention, including lying in a collapsed state within ten feet or so.

Using a motor-car it is possible to locate easily even the eggs of so exceptionally a wary bird as the East African Greater Bustard, *Ardeotis kori struthiunculus* (Neum.) as described by Archer (1937) "As to the finding of the eggs, it will suffice to say that the use of a motor-car overcomes all difficulty. No bird is keener sighted or more suspicious of man's approach on foot than the Greater Bustard. Yet each and all would walk up to their eggs and settle down on them unhesitatingly when the car was standing in full view within fifty yards."

From my own experience and from the observations of others, one knows how simple, though often unintentional, it can be to find when motoring the nests of shy, African ground-nesting species, such as some of the plovers, coursers and bustards.

At Entebbe, on one exceptionally wet morning in the breeding season—during a deluge—six nests which the brooding *pecuarius* were naturally loth to abandon, were easily located in a small, sandy, short-tuft-grass area.

Melliss (1870) wrote "It lays in the summer months of December and January, two eggs, in colour grey, with black markings . . . makes no nest, but lays its eggs in dry cow dung on the exposed open ground . . . and it is "stated" "slightly covers them, but does not sit upon them." He further records that the "Eggs closely resemble the background and are difficult to distinguish" and that it is "doubtful if it ever leaves the island".

The reference to "dry cow dung" is an interesting observation and an indication that this bird will take advantage of any situation which is soft and friable, to lay its eggs, where soil conditions are otherwise unfavourable.

In the Lake George and Lake Edward region of western Uganda where the soil is hard and where strips of sandy foreshore are frequented by numerous hippopotamuses the scattered population of *C. pecuarius* frequently made use of dry buffalo, dry hippo or disintegrating elephant droppings for a nest site. I found several such nests, as also did one of my Fisheries Officers. The eggs of the Water Thick-knee or Water Dikkop, *Burhinus vermiculatus büttikoferi* (Reichw.) in this locality too were more than once found in similar sites.

The use of dry and disintegrating animal droppings as a nesting site, by *C. pecuarius* is evidently commonplace, for Vincent (1953) records "c/2 amongst dried hippo dung" and Hall (1958) refers to "cow or horse-dung nest sites."

In Northern Rhodesia towards the end of the dry season, I found *C. pecuarius* nesting on sun-baked black soil on the Kafue Flats, a long way from water after the floods had receded. In the blistering midday heat, on 3rd October 1931, I easily found two nests each containing two eggs as the sitting birds were reluctant to leave their eggs under such unfavourable conditions. The two fresh eggs of one set were scarcely covered when the parent at last left as the only loose materials available were some small pieces of broken soil and grass stubs; but, notwithstanding the obvious difficulties, the other set which had been incubated for

about a week were so well concealed that only a tiny portion of the top of each egg was visible, and even then I had rather quickly driven away the parent before it could finish covering them completely. Although *C. pecuarius* prefers a sandy or friable soil in which to nest, it is evident that such conditions are not essential, so it should not have been extraordinary for the immigrant sand-plovers to establish themselves on St. Helena and breed under conditions no worse, if not a good deal better, than those in which they are sometimes found nesting on the mainland.

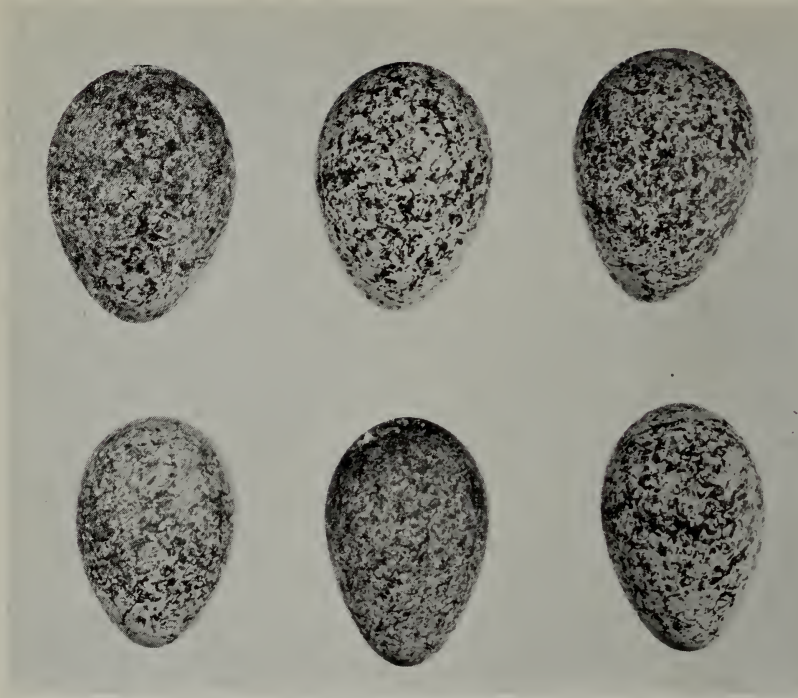
There were other nests of *C. pecuarius* on the Kafue Flats which I did not disturb, as well as a breeding colony, with eggs, of the African Pratincole, *Glareola pratincola fülleborni* Neum. Both species, under the prevailing conditions of furnace-like heat, returned to their eggs as quickly as possible. From the convenient shelter beneath a 1½ ton truck I was able to watch with binoculars some brooding change-overs of each species and it was noticeable that the newcomers of both the sand-plovers and the pratincoles seemed on arrival to have wet breasts which doubtless would have considerably benefitted the eggs. In Northern Rhodesia breast-feather wetting by incubating birds has also been recorded by Wright (1963) in the case of *Lobivanellus senegalus lateralis* (Smith) and by Bainbridge (1965) with reference to *Lobivanellus albiceps* (Gould).

All species of birds have long been protected on St. Helena—since 1894 and some of them much earlier—but by virtue of a scientific permit granted through the courtesy of the Governor, Sir Robert Alford, Loveridge collected a series of eight Wirebird's eggs, 3/2 and 2/1, which he generously presented to the British Museum (Natural History).

Eggs: The eggs of *sanctae-helenae* are typical *C. pecuarius* eggs in respect of coloration and markings as the illustration shows and there is generally no tendency for the markings to form a zone or girdle anywhere around the eggs as is sometimes found in the case of *pecuarius* though some of the markings on an egg in the British Museum (Natural History) collection have formed a blackish cap. Seven of Loveridge's eggs are similarly marked, fairly thickly irregularly and boldly all over with black and sepia mottling and some fine dark streaks, on very sparse underlying grey. One egg has duller, more streaky markings of sepia on a pale greenish-stone ground. The ground colour of the others varies from a warm creamy-buff to creamy-stone, though three of the eggs are faintly tinged a pale grey-greenish or very pale greenish-olive. All eggs are smooth and without gloss and in shape, as the illustration shows, are inclined to be pyriform, though less so than those of nominate *C. pecuarius*. The eggs of both races are large for the size of the bird. Those of *sanctae-helenae* are of rather even size, but are markedly broader and average distinctly larger than those of *pecuarius* from the mainland, as can be clearly seen in the illustration showing the natural-size eggs of the two races.

Loveridge's eight eggs (British Museum 1959, 6.1–5) average 32.48 x 24.4 mm., their measurements ranging from 30.3–33.2 x 23.6 x 24.7 mm. 30.3 and 23.6 mm. constitute respectively exceptionally short and narrow measurements.

Five eggs of *sanctae-helenae* collected by Haydock in 1952 are said to average 35 x 25 mm., which seems to be rather large.



The eggs, natural size, of *Charadrius pecuarius sanctae-helenae* above, and *Charadrius pecuarius pecuarius* below.

Five eggs of *sanctae-helenae* (at the British Museum, Natural History) the first one taken in 1870, were collected between 1870 and 1911 and average 34.58 x 25.0 mm., with a measurement range 32.3–36.5 x 24.6–25.5 mm.

It will be noticed that Loveridge's eggs, the most recent, average markedly smaller than the five originally collected, as well as Haydock's five eggs (which are not available for check). Is it possible that the eggs (and perhaps the birds) of *sanctae-helenae* are gradually decreasing in size? and perhaps reverting towards the size of those of mainland *pecuarius?*

For comparison, the following are some measurements of the eggs of nominate *C. pecuarius:*—

SOUTH AFRICA (i) McLachlan and Liversidge (1957)
100 eggs average 31.9 x 22.2 mm.: range 28.6–34.4 x 19.0–23.2 mm.
19.0 mm. is abnormally narrow.
(ii) General R. M. Betham (personal communication):
50 eggs average 31.84 x 22.8 mm.: range 30.1–34.1 x 21.0–24.2 mm.
(iii) Eggs personally examined or measurements sent to me.
29 eggs average 31.68 x 22.22 mm.: range 29.2–34.2 x 20.4–23.5 mm.
20.4 mm. for breadth is rather small.

NORTHERN RHODESIA (NOW ZAMBIA): Own eggs, four and two from C. W. Benson. 6 eggs average 30.5 x 21.4 mm.: range 29.3–31.8 x 21.1–21.7 mm.

UGANDA: Fourteen eggs self-collected; two eggs Jackson (1938). 16 eggs average 31.0 x 22.0: range 27.5–32.8 x 21.4–22.7 mm. Measurements of 27.5 mm. (length) and 21.4 mm. (breadth) are abnormally small.

WEST AFRICA—GOLD COAST (NOW GHANA): *Vide* Bannerman (1951). 8 eggs average presumed c. 31.25 x 21.5 mm. maximum 32.5 x 22.0 mm. and minimum 30.0 x 21.0 mm.

Egg-covering: As a result of extensive investigations Hall (1958) is of the opinion, which is doubtless correct, that human disturbance is the stimulus which developed egg-covering. He noticed that a bird disturbed from its eggs by cattle does not cover its eggs, and in my own experience eggs were only partially covered—possibly the bird was brooding them like this—when a dog on several occasions disturbed the parent. Birds flushed from nests by a horseman or a motor car have left the eggs uncovered. When parents change over at the nest, as one would expect, the eggs are not covered.

On St. Helena the Wirebird, many of which are normally in constant contact with settlement and the human population, moves away to nest on open expanses where the possibility of disturbance is negligible. But human intrusion on the breeding ground does result in a measure of egg-covering. Can this be regarded as an inherent characteristic of a species which must have originated from the mainland of Africa and where this procedure is normal?

The newly hatched young also have sometimes been found covered in the nest. This is deliberate and not accidental, for in those cases when the buried young were left uncovered by an intruder, shortly afterwards they were found to have been re-buried.

Solicitude for a down chick can sometimes induce an anxious *C. pecuarius* parent to overcome its normal wariness and behave in quite extraordinary fashion as I once experienced at Entebbe. From the extravagant posturings—again and again it went through the whole of its extensive distraction repertoire—I knew that near at hand it must have a tiny chick (or chicks). But half-an-hour's meticulous search, virtually inch-by-inch of a very small area drew a blank. Then, as the light was failing and the chill of evening set in, the female (presumed) parent, while my back was turned momentarily, deliberately brooded the chick not six feet distant. I was certain that the chick could not have avoided our thorough scrutiny (for I was not alone) and must have been entirely or partially buried. The mate was always near by, but not so actively solicitous.

Downy chick: Haydock (1954) describes the Wirebird's down plumage as "buff streaked black and a tinge of grey, but unlike the eggs", and "The legs were olive-green and not black as in the adult". According to van Someren (1934) the nestling plumage of *pecuarius* is "Crown and back greyish to white mottled and spotted with dark ashy-grey, the dorsum with a dark line, and one on the wing, the dark area of the crown separated from that of the back by a white ring; under surface white". Haydock's

description is insufficiently specific to enable a useful comparison of the downy chicks of the two races, although it would appear that *sanctae-helenae* is generally buff, and *pecuarius* grey. For comparative study a series of downy chicks and fledglings of *sanctae-helenae* would be of considerable value.

Nesting behaviour: Haydock (1954) records "The eggs are laid in a shallow depression formed by the bird circling breast down in the grass and the nest is not lined, but small bents and grasses are laid around the site"—these are for covering the eggs. Neither he, nor Loveridge, makes any reference to unoccupied or 'spoof' nests, which is a common characteristic of the mainland *pecuarius*. Haydock also describes how "When approached the sitting bird rises and with its back to the nest circles, kicking the outer bents and grasses over the eggs, then walks away, dragging a wing in feigned injury". Hall (1958) after protracted study of the breeding behaviour of *pecuarius* in South Africa described the egg-covering as "sideways action of the feet before the nest is left", *i.e.* the bird is standing *over* its eggs as it covers them. This agrees with my own observations, as well as with those of van Someren (1934) and many others; it is the sideways shuffle, as the bird rises, which is the basis of the operation, skilfully executed in a few seconds, which Hall has timed to be as little as three seconds.

On the African mainland it is usual for *pecuarius* to indulge in all manner of deliberately misleading behaviour the better to conceal the whereabouts of its nest, such as spoof nest-making, spoof brooding and false feeding, and even more disconcerting this is often done when there is no nest. Information is lacking as to whether *sanctae-helenae* resorts to these ruses, but according to Loveridge (*in litt.*) false feeding by a flushed brooder is very common. On the other hand distraction display by injury feigning on the part of *pecuarius*, does indicate the presence of eggs or young.

Occasionally one may come across a surprisingly confiding example of a brooding *pecuarius*, as described by Bevan and Chiazzari (1943) who "almost touched a singularly tame sitting bird."

In my own experience *pecuarius* at breeding time is inclined to group in a relatively small area—sometimes with nests not many yards apart, as is also recorded by Hall—even though there may be considerable expanses of suitable terrain available; but Haydock makes no mention of the proximity or otherwise of the nests of *sanctae-helenae*. Loveridge, however, informs me that none of the 19 nests with eggs he found were in close association, that is none was within 50 feet of another.

Voice: The calls of *sanctae-helenae* and *pecuarius* appear to be similar.

Enemies: Except members of the human race, *C. sanctae-helenae* seems to have few, if any, enemies, and according to Loveridge "Besides possible human predators, wirebirds are wise to conceal their eggs from the sharp eyes of the ubiquitous mynas who are forever sucking each other's eggs besides killing mice, geckos and frogs. Again, this island is periodically plagued by a burgeoning of rats—momentarily held in check by a poison-bait campaign." But Loveridge offers no evidence that such predation does in fact occur.

Acknowledgments: I am greatly indebted to Arthur Loveridge for his much appreciated co-operation in obtaining a valuable series of eggs,

together with his useful observations; and to C. J. O. Harrison of the Bird Room, British Museum (Natural History) for checking the egg measurements. Both these authorities, and also C. W. Benson, have kindly read through this paper prior to publication and I am grateful for their comments and advice.

SUMMARY

1. The claim that when St. Helena was discovered in 1502 the island was covered with forest is probably erroneous.
2. The possibility that *Gallinula chloropus*, the Moorhen, has long been a resident (though disappearing for a while) and that in the past, on the evidence of fossil remains, there were other indigenous species, in addition to *C.p. sanctae-helenae*, is mentioned.
3. The origin of the species *Charadrius pecuarius* is discussed.
4. *Charadrius pecuarius sanctae-helenae* or Wirebird, which must have originated from the African mainland, *c.* some 1,300 miles distant, is exclusive to the island of St. Helena.
5. *C.p. sanctae-helenae* is a larger bird than nominate *Charadrius pecuarius*, and its eggs, too, are larger.
6. There are plumage, down chick and egg differences in these two races.
7. Breeding behaviour and nesting habits of the two races are compared.
8. It is suggested that the eggs of the Wirebird may be subject to some predation.

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